

Title (en)  
METHOD OF DETECTING SPACE DEBRIS

Title (de)  
VERFAHREN ZUR ERKENNUNG VON WELTRAUMMÜLL

Title (fr)  
PROCÉDÉ DE DÉTECTION DE DÉBRIS SPATIAUX

Publication  
**EP 2615582 A4 20151007 (EN)**

Application  
**EP 11823633 A 20110908**

Priority  
• JP 2010203481 A 20100910  
• JP 2011070478 W 20110908

Abstract (en)  
[origin: EP2615582A1] A method of detecting space debris includes generating a virtual space debris piece in accordance with the law of conservation of mass by applying a debris breakup model to an object of breakup origin which is likely to have broken up on a geocentric orbit in the past (steps 1 and 3), calculating an orbit of each virtual space debris piece during fixed point observation by applying a debris orbit propagation model to the virtual space debris piece (step S5), and generating appearance frequency distribution of a motion vector of each virtual space debris piece on the celestial sphere on the basis of a result of the orbit calculation (step S13). The series of the above steps are executed multiple times (step S9, step S11). The method further includes setting a search range vector on the basis of a motion vector having a high level of the appearance frequency distribution of the motion vector, and applying a stacking method to regions in images captured at time intervals during the fixed point observation, the regions being shifted along the search range vector sequentially in the order of capture, thereby detecting space debris appearing on the images (steps S17 to S21).

IPC 8 full level  
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CPC (source: EP US)  
**B64G 3/00** (2013.01 - EP US); **G06T 7/277** (2017.01 - EP US); **B64G 1/242** (2013.01 - EP US)

Citation (search report)  
• [A] US 2003202682 A1 20031030 - YANAGISAWA TOSHIFUMI [JP], et al  
• [A] YANAGISAWA T ET AL: "Detection of small GEO debris by use of the stacking method", JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES. TRANSACTIONS, NIHON KOKU UCHU GAKKAI, JP, vol. 44, no. 146, 1 February 2002 (2002-02-01), pages 190 - 199, XP002516423, ISSN: 0549-3811, DOI: 10.2322/TJSASS.44.190  
• See also references of WO 2012033159A1

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